2014 Colorado Ozone Review and New NAAQS Proposal

Current
2008 National Ambient Air Quality Standard (NAAQS)

0.075 ppm (or 75 ppb) as the
3-year average of the
4th maximum 8-hour values

(Primary and Secondary)

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3-year average accounts for meteorological variations.
Smooths the data.

Note: Truncate (not round) data beyond the 3rd decimal, so can actually go up to 0.075999 an not violate).

NOTE: Colorado ozone season, per EPA = April-September.

For NAAQS of 75 ppb

Three Year Average 4th Maximum Ozone Values

East Slope Sites		2011	2012	2013	2014	2011-2013	2012-2014	*2015*
Site Name	AQS #	8-hr. O3 4th Max. Value (ppm)	8-hr. O3 4th Max. Value (ppm)	8-hr. O3 4th Max. Value (ppm)	8-hr. O3 4th Max. Value (ppm)	3-yr. Avg. 4th Max. Value (ppm)	3-yr. Avg. 4th Max. Value (ppm)	*Highest 4th Max. to not exceed (ppm)*
Welby	08-001-3001	75	77	77	67	76	73	*83*
Highland	08-005-0002	78	80	79	---	79	---	---
Aurora East	08-005-0006	77	74	73	67	74	71	*87*
S. Boulder Creek	08-013-0011	76	76	79	70	77	75	*78*
CAMP	08-031-0002	---	68	67	61	---	65	*99*
La Casa	08-013-0026	---	---	71	66	---	---	*90*
Chatfield State Park	08-035-0004	82	86	83	74	83	81	*70*
USAF Academy	08-041-0013	74	75	74	64	74	71	*89*
Manitou Springs	08-041-0016	75	75	72	62	74	69	*93*
Welch	08-059-0005	77	79	80	66	78	75	*81*
Rocky Flats North	08-059-0006	81	84	85	77	83	82	*65*
NREL	08-059-0011	83	81	84	76	82	80	*67*
Aspen Park	08-059-0013	72	77	77	65	75	73	*85*
Fort Collins - West	08-069-0011	80	80	82	74	80	78	*71*
Fort Collins - CSU	08-069-1004	68	74	74	72	72	73	*81*
Weld County Tower	08-123-0009	77	80	73	70	76	74	*84*
NPS - Rocky Mtn. NP	08-069-0007	77	79	74	69	76	74	*84*
NOAA - BAO Tower	n/a	75	76	70	67	73	71	*90*
NOAA - Niwot Ridge	n/a	69	75	71	65	71	70	*91*

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NAAQS = National Ambient Air Quality Standard
3-yr avg. of 4th max <= 0.075 ppm (75 ppb)
Exceedance of NAAQS is not necessarily a violation of NAAQS
The 3-year average provides the public health perspective / NAAQS comparison.

Note that even though 2012 was a bad year for ozone in that there were many exceedances, the 4th max values are quite similar to other years.

Only 2 sites violated NAAQS in 2010, 3 sites in 2011, 7 in 2012, 10 in 2013, now down to 4 in 2014.
2014 max possible values are quite low for a number of sites.

For NAAQS of 75 ppb

Three Year Average 4th Maximum Ozone Values

West Slope Sites Site Name	AQS #	2011 8-hr. O3 4th Max. Value (ppm)	2012 8-hr. O3 4th Max. Value (ppm)	2013 8-hr. O3 4th Max. Value (ppm)	2014 8-hr. O3 4th Max. Value (ppm)	2011-2013 3-yr. Avg. 4th Max. Value (ppm)	2012-2014 3-yr. Avg. 4th Max. Value (ppm)	*2015 Highest 4th Max. to not exceed (ppm)*
Rifle - Health	08-045-0012	66	68	62	61	65	63	*104*
Palisade - Water	08-077-0020	66	71	66	62	67	66	*99*
Lay Peak	08-081-0002	---	66	65	62	---	64	*100*
Cortez	08-083-0006	71	70	64	62	68	65	*102*
CASTNET - Gothic	08-051-9991	64	70	64	63	66	65	*100*
USFS - Walden	08-057-0003	---	59	64	59	---	60	*104*
USFS - Shamrock	08-067-1004	77	69	72	64	72	68	*91*
SUIT - Ignacio	08-067-7001	72	67	69	67	69	67	*91*
SUIT - Bondad/Hwy 550	08-067-7003	69	69	67	65	68	67	*95*
NPS - Mesa Verde NP	08-083-0101	70	69	69	65	69	67	*93*
Pitkin Co. - Aspen	08-097-0007	64	---	---	62	---	---	---
BLM - Meeker	08-103-0005	63	64	64	62	63	63	*100*
BLM - Rangely	08-103-0006	73	69	91	62	77	74	*74*

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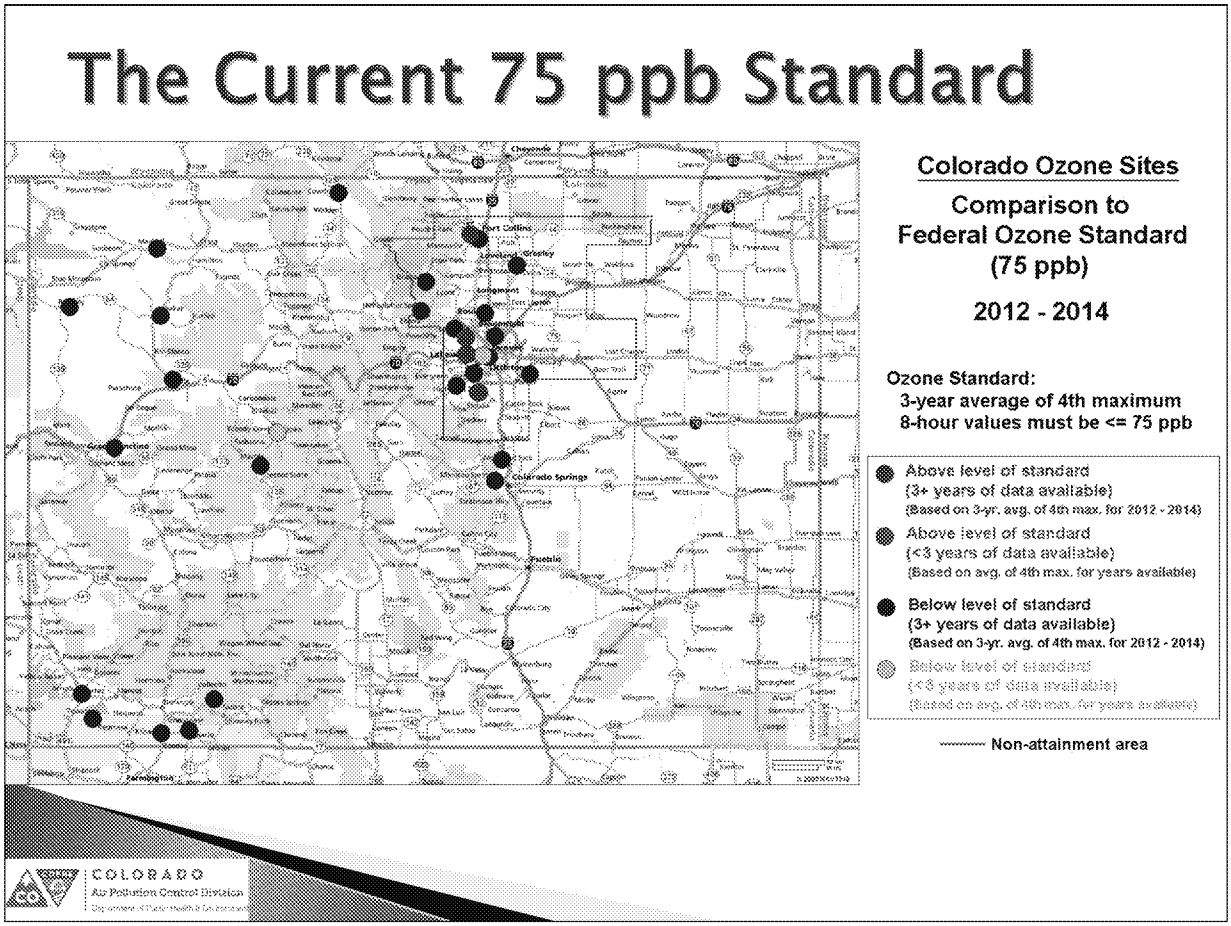
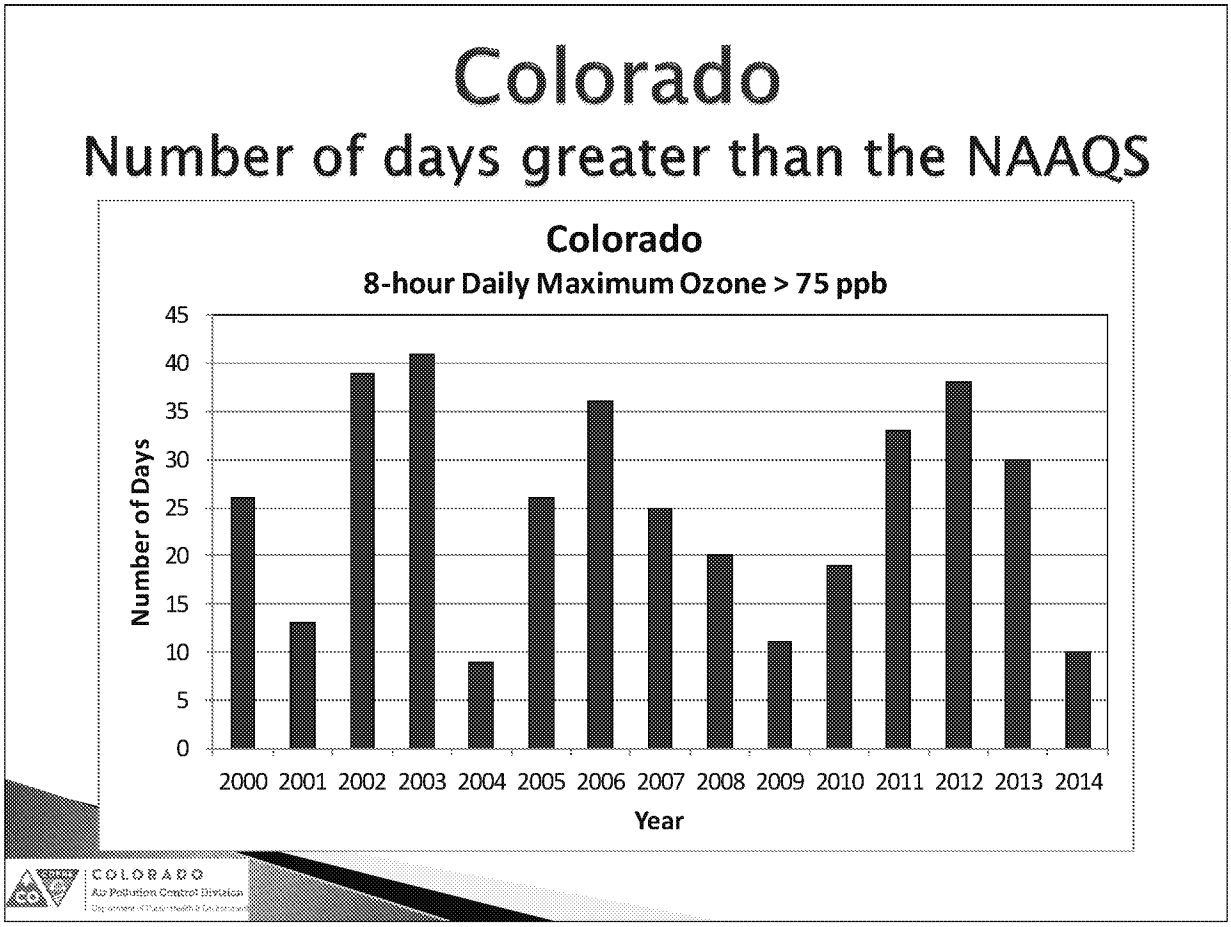
Rangeley violating for 2011-2013, but just below for 2012-2014.

Note that Gothic can have high values, even though it is isolated….provides information on background and transport from the west.



The DMA/NFR violates the current NAAQS.
Rangely not violating for 2012-2014. (Was violating for 2011-2013)
Note sites on west slope and SW….many are not APCD sites.

(point out Rangely and Gothic mnitors, and also Springs area)



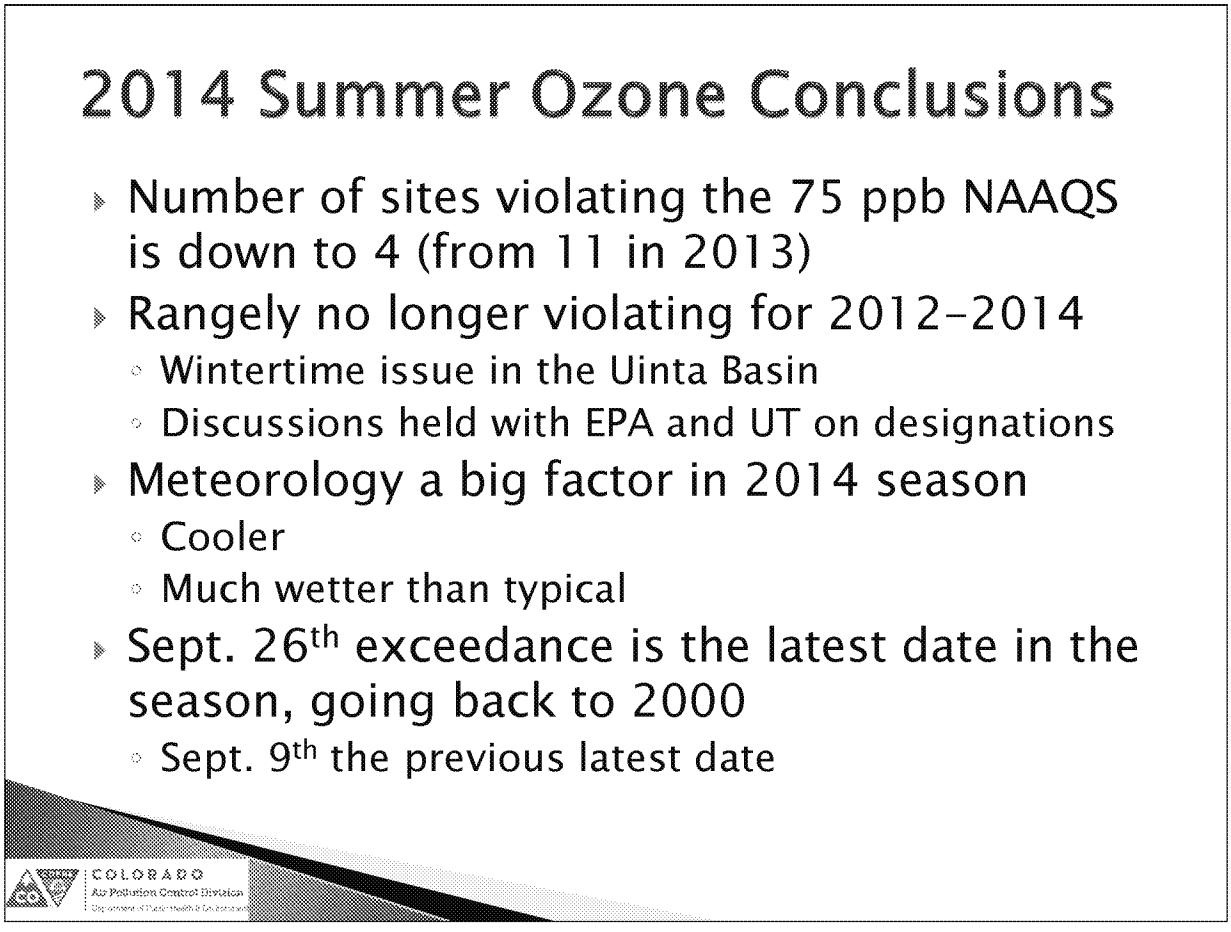
All Colorado

Cyclical trend mainly due to Front Range, though overall appears to be decreasing on higher values. NREL & Rocky Flats-N have had a slight decreasing trend.
Overall, the high peaks tend to be decreasing.

Need many years to see a trend.
Has a cyclical nature like in North Front Range.

2014 was a clean summer due to the meteorology.

Keep in mind, population and industry have increased significantly over this period, but high days are decreasing a bit.



Rangely = wintertime Uinta Basin issue. Not clear in CFR as to whether designations are done between NAAQS reviews.

Uinta Basin is a mix of ownership and responsibilities.
EPA – Uintah & Ouray Tribe
CO and UT – non-tribal lands, incl. BLM

Winter-time issue only
Snow cover
Strong inversions

As of 2014:
- CO
  - BLM-Rangely has 4 years of "regulatory" data
  - Lay Peak has 3 years of "regulatory" data
- UT
  - Vernal has 3 years of "regulatory" data
  - Roosevelt has 3 years of "regulatory" data

While Rangely has gone down, Vernal and some others in UT still high

Ozone NAAQS Proposal

- EPA released a new NAAQS proposal on Nov. 26, 2014 (posted Dec. 17, 2014 in FR)
- Primary standard in range of 65-70 ppb
  - Taking comments on range, 60 ppb up to 75 ppb
  - Retain the 8-hour form
  - Change the applicability hours to be 7:00 a.m. to 11:00 p.m. for the start of 8-hour averaging periods to avoid double-counting across days
- Secondary standard in W126 range of 13-17 ppm-hours, using 65-70 ppb as a surrogate
  - Taking comments on W126 form (ppm-hr) vs. ppb
  - Taking comments on range, 7 ppm-hours up to 17 ppm-hours or up to 75 ppb

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W126 = Biologically relevant weighted cumulative exposure index

Proposal (continued)

- AQI break-points to change according to a final primary NAAQS level
- Monitoring season to change for 33 states
- Monitoring to be required year-round at NCore sites
- Exceptional event deadlines to be revised
- Require PAMS monitoring (Jun-Aug) at NCore sites in existing non-attainment areas, to include hourly speciated VOCs, carbonyls, NO/NO2/NOy, and upper air meteorology
- Require an Enhanced Monitoring Plan be developed for all ozone NAAs to look at what O_3, NOx, PAMS and meteorological monitoring is appropriate or needed
- Add a new Federal Reference Method analyzer
- Grandfather PSD sources currently under permit review with complete applications as they relate to causing or contributing to a NAAQS violation

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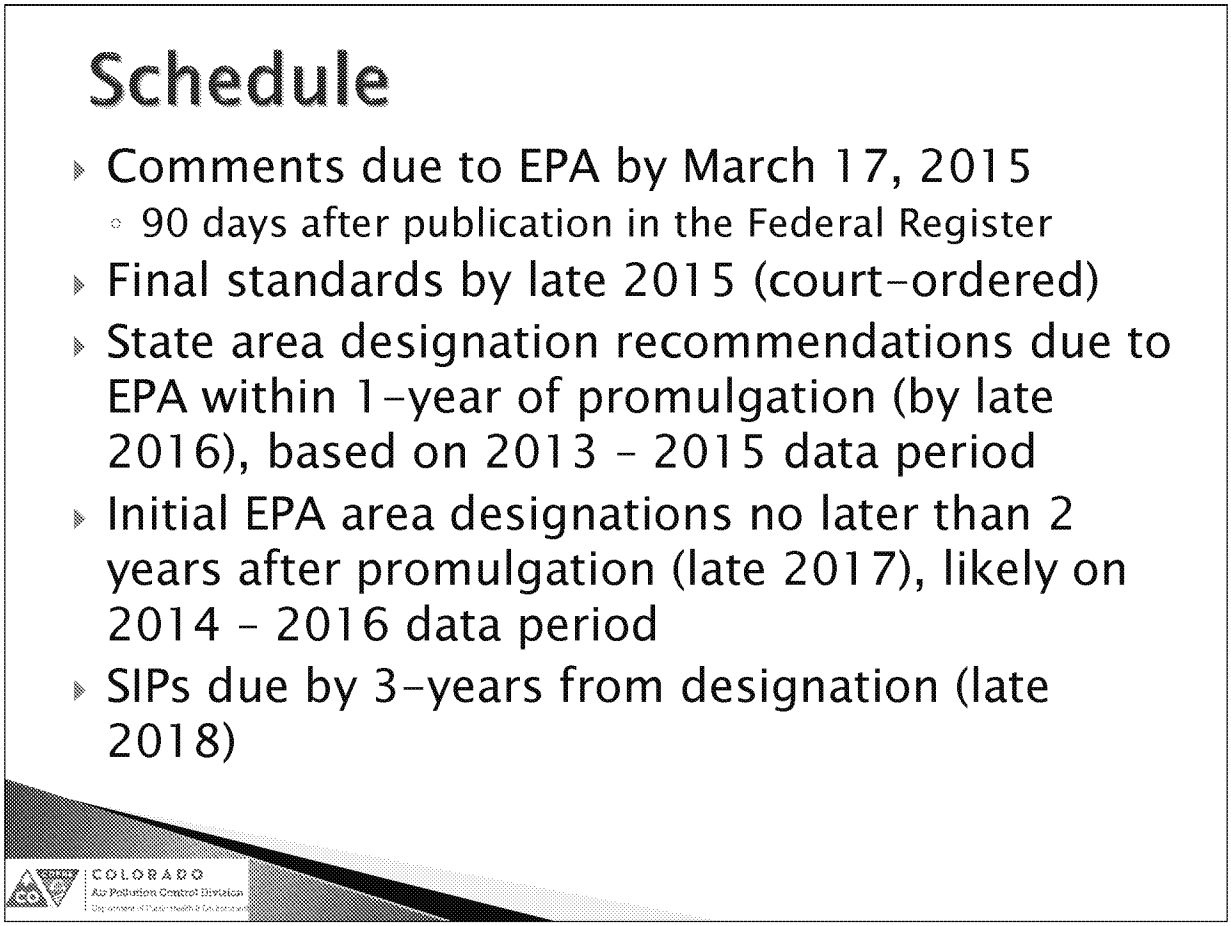
AQI = Air Quality Index

PAMS = Photochemical Air Monitoring Station



EPA must sign by Oct 1, won't become effective until after publication in FR

All unccertain as EPA rolls out and litigation unfolds

Discuss status and potential scope of our comments – science; implementation guidance (just got it for 2008 standard); high background; exceptional events

Implications for Colorado

- Designated monitoring season would change from Mar.-Sep. to year-round (Jan.-Dec.)
- PAMS monitoring will be required at existing LaCasa NCore site in Denver
- At 70 ppb using 2012-2014 data, NAA could be:
  - Denver/North Front Range
  - Colorado Springs/El Paso County area
  - Rangely/Uinta Basin (will need to be joint with UT)
- At 65 ppb using 2012-2014 data, NAA could be:
  - Denver/North Front Range
  - Colorado Springs/El Paso County area
  - 4-Corners area
  - Rangely/Uinta Basin (will need to be joint with UT)
  - Grand Junction/Mesa County area

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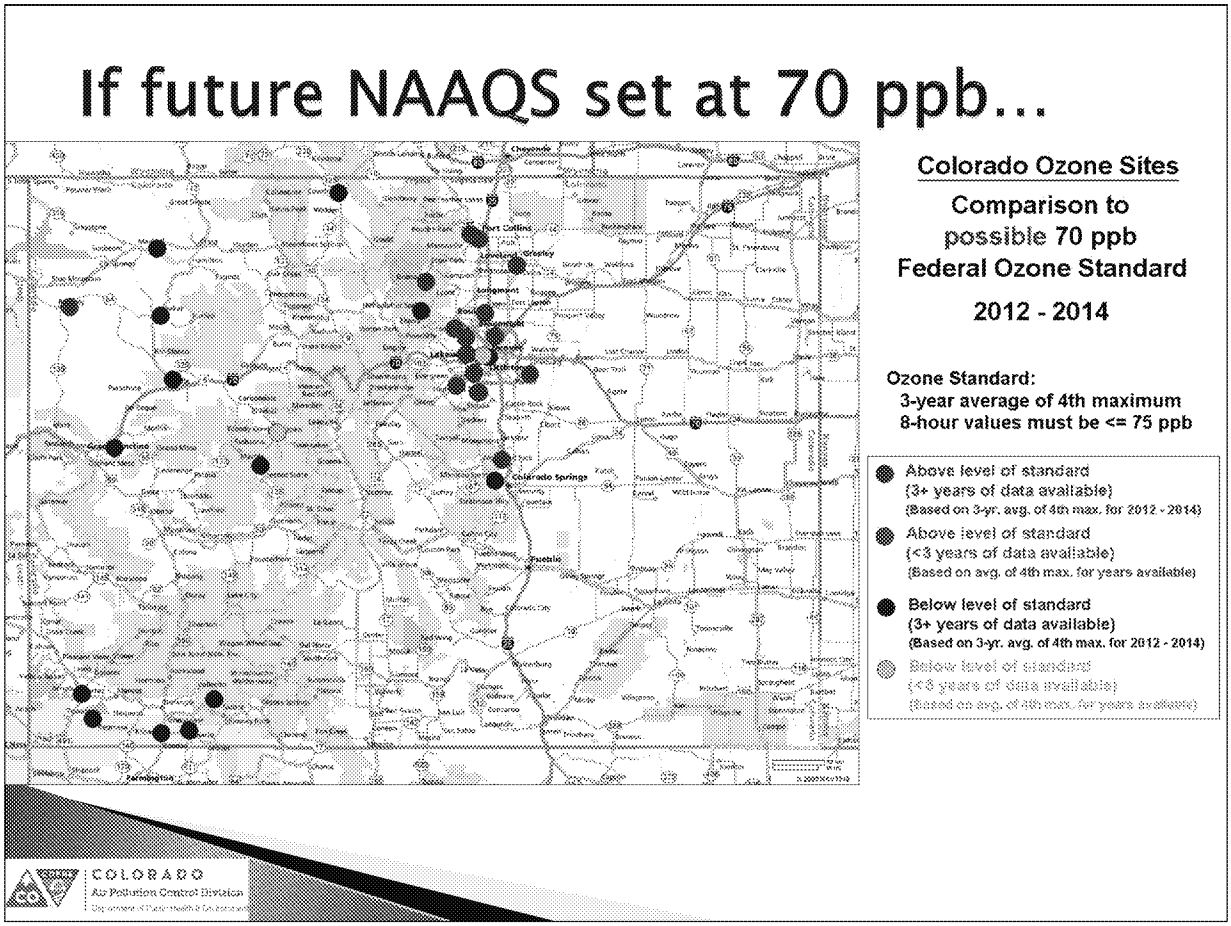
PAMS = Photochemical Air Monitoring Station

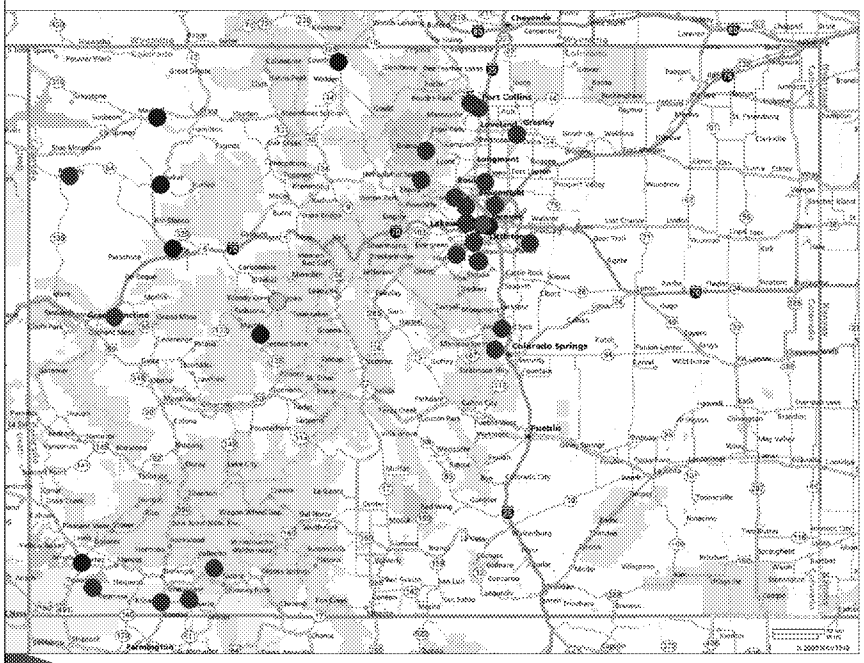


Gothic has had a slight decreasing trend.

Note that Gothic can have high values, even though it is isolated….provides information on background and transport from the west.

Not a lot of wiggle room above Gothic that we can control.

If future NAAQS set at 65 ppb…



Colorado Ozone Sites

Comparison to possible 65 ppb Federal Ozone Standard

2012 - 2014

Ozone Standard:
3-year average of 4th maximum 8-hour values must be <= 75 ppb

- Above level of standard (3+ years of data available) (Based on 3-yr. avg. of 4th max. for 2012 - 2014)
- Above level of standard (<3 years of data available) (Based on avg. of 4th max. for years available)
- Below level of standard (3+ years of data available) (Based on 3-yr. avg. of 4th max. for 2012 - 2014)
- Below level of standard (<3 years of data available) (Based on avg. of 4th max. for years available)

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Various Technical Tools

- 2014 NCAR "Front Range Air Pollution and Photochemistry Experiment" (FRAPPE)
- 2014 NASA "Deriving Information on Surface Conditions from Column and Vertically Resolved Observations Relevant to Air Quality" (DISCOVER-AQ)
- 3-State Study Data Warehouse
  - Includes monitoring and modeling
- Colorado State University Oil and Gas Dispersion Studies
  - Garfield County
  - North Front Range

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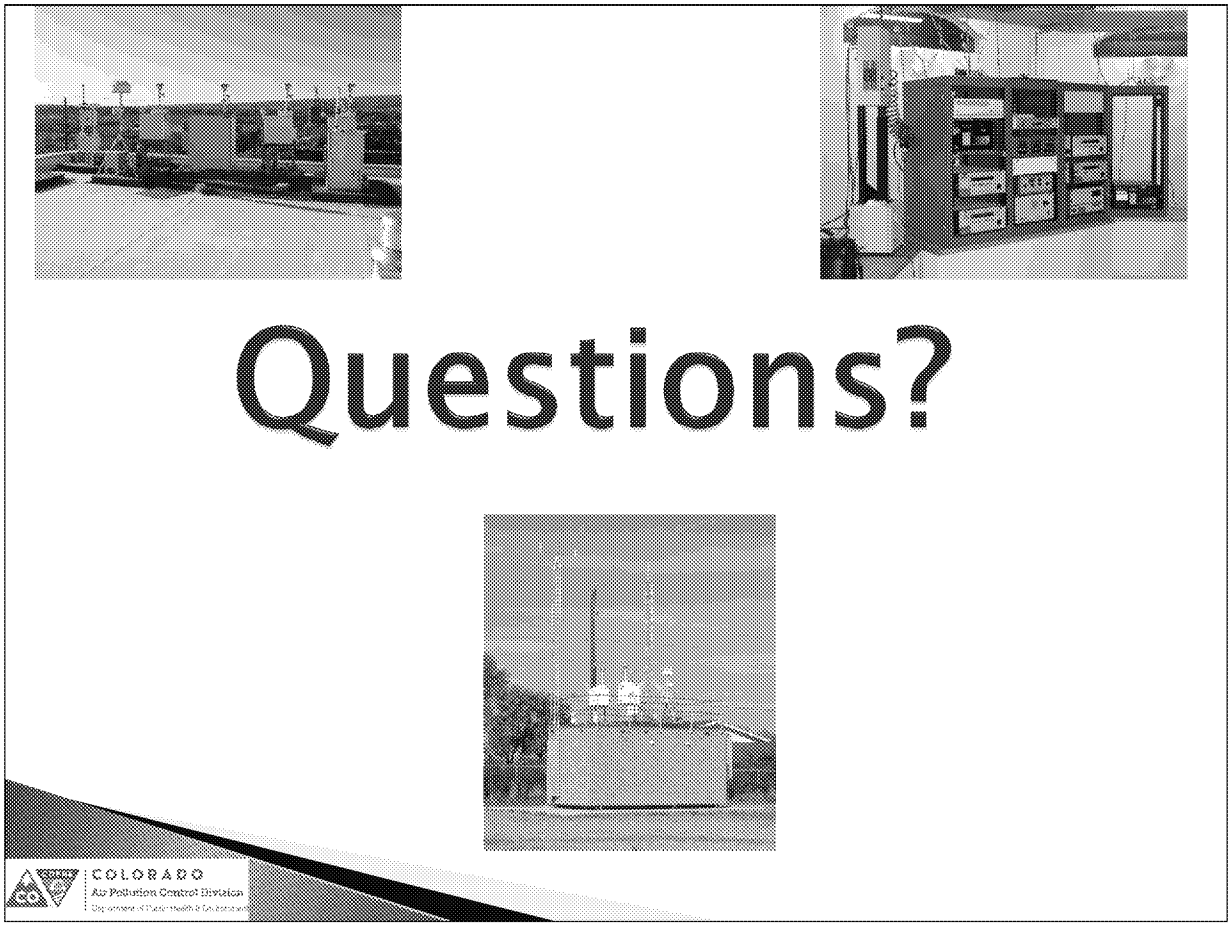

Top left grand junction; top right CAMP; bottom N-Core